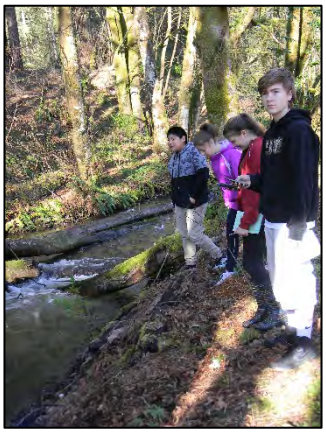
PACIFIC EDUCATION INSTITUTE

# Outdoor Learning in Shelton:
## A Surge of Hope

By Eleanor Steinhagen

### Bayshore Preserve – Shelton, WA

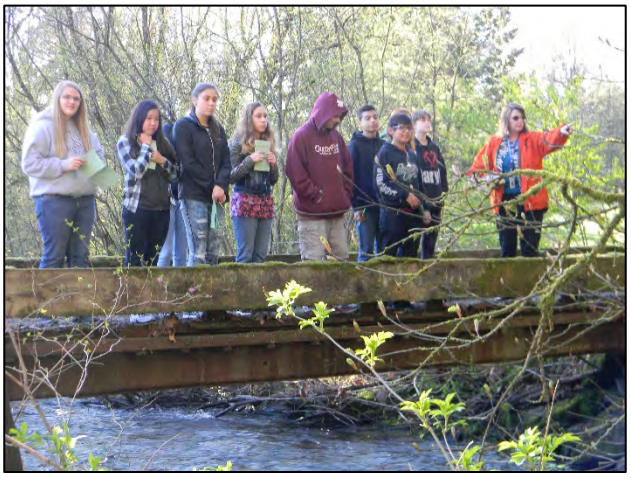
Two 7th graders have just tossed their pears into Johns Creek and are jogging downstream to see which one will cross the finish line first. Maneuvering around a large maple tree and jagged rocks on the stream's bank, a handful of their classmates jog with them, including two "timers" who hold stopwatches in front of their chests, ready to hit the stop button when their designated pear reaches the finish line. The pears bob up and down for a moment, then drift into the creek's swiftly flowing current and float eastward toward Oakland Bay.



The rest of the students are already standing at the finish line, peering upstream and cheering on their desired winner as they hunch forward and hide their hands in their sleeves to protect them from the frigid October morning air. It's a sunny morning, but the temperature hovers in the high 30s and is slow to rise in the shade by the creek. As the winning pear crosses the finish line 25 seconds after the start of the race, several kids break into a loud cheer, while others throw their hands in the air, or turn away and yell, "Aw, man!" in disappointment.

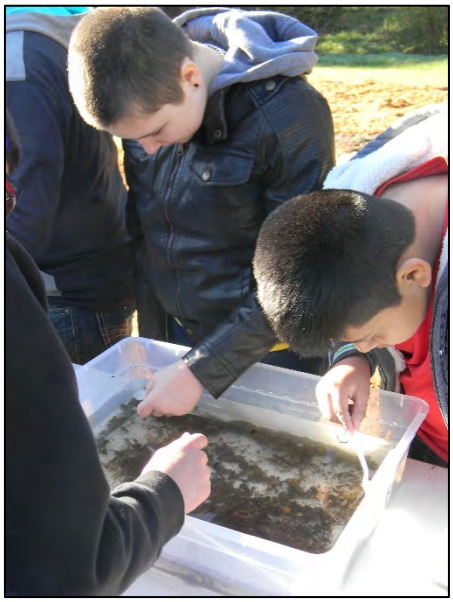
The race was one of three that this group of 13 students conducted as a means of collecting the data they needed to measure streamflow in the creek at Bayshore Preserve, a 74-acre former golf course three miles northwest of Shelton, Washington, conserved by Capitol Land Trust in 2014. Before the race, the students learned about side channels and discussed how they impact flow; they measured the distance from the race's starting line to the finish line, or the "reach"; they discussed key concepts they are learning in class, such as "ecosystem" and "biodiversity"; and, standing mere feet from the creek's sand, cobble and stoneflies, they learned about the variety of sediments and creatures in northwest streams and where each can be found according to streamflow. Throughout the lesson, they used field journals to take notes and record data, including the depth and width of the section of the creek they were studying—information they would use to perform calculations in math class later that week.

The students' work at Johns Creek is the culmination of three years of effort made by several groups to design and implement high impact field experiences for every student in the Shelton School District. The program started with a conversation at a community stakeholder meeting in 2014 between Margaret Tudor, then-Executive Director of Pacific Education Institute (PEI), Wendy Boles, Shelton School District Science Curriculum Leader and Science Teacher at Olympic Middle School, and Amanda Reed, Executive Director of Capitol Land Trust. Since the fall of 2015, Capitol Land Trust has been facilitating these field investigations for every 7th grader in the

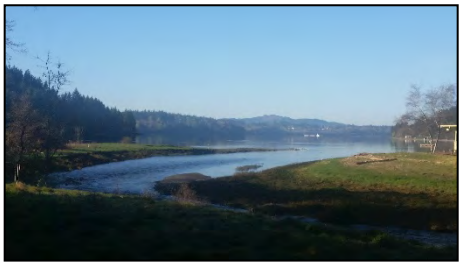


Shelton School District—serving around 300 students per year—using PEI's trademark FieldSTEM model as a foundation for the work. At the same time, the district has developed and begun implementing a plan with PEI to get every student, kindergarten through 9th grade (with the goal of extending that to K-12), out into the field to learn locally-relevant, hands-on, career-connected science, technology, engineering and math (STEM). In addition to Capitol Land Trust, Shelton School District and PEI, a handful of dedicated volunteers and other community stakeholders, such as the Squaxin Island Tribe, Mason County Conservation District, Green Diamond Resources and Taylor Shellfish, have stepped forward to support the program.

The students go to Bayshore in October and spend an hour and a half at either the "Freshwater" or "Tidal Life" stations, and return in March to help gather data for the field investigation in which they didn't participate in the fall. Both of the stations provide them with the opportunity to learn about macroinvertebrates, a critical part of the food web and also an indicator of water quality in both fresh and saltwater ecosystems. Last year as 6th graders, they investigated pollution in various beach ecosystems along Oakland Bay. And next year, they'll go to the Lake Cushman Dam and Skokomish Estuary to investigate the ways that communities meet their energy demands.



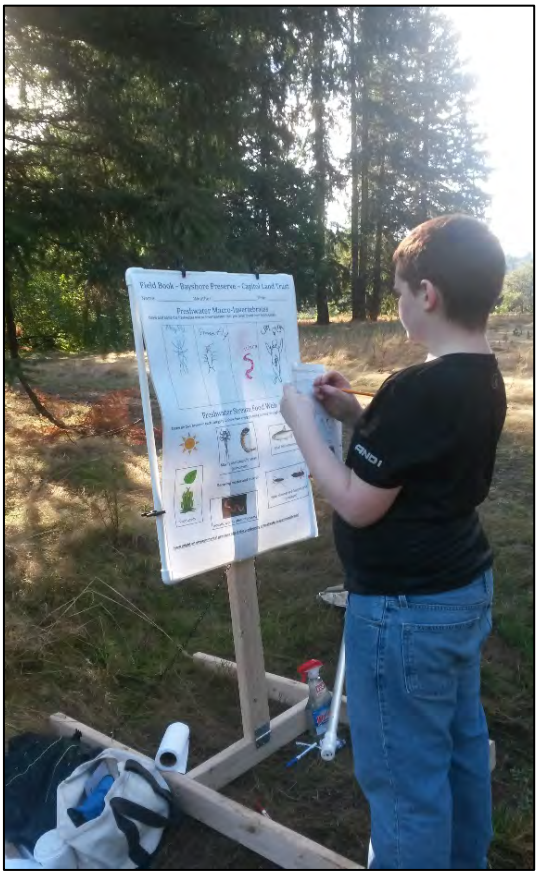
This type of outdoor hands-on STEM learning appeals to many learner types and helps students overcome barriers to learning often found inside the classroom. During this first field investigation day, a group of students was asked why they liked learning science outside. Rian, a student at Olympic Middle School who used to go clamming near Bayshore with his mom and grandparents, said, "I know some kids, they're better with a complete visual. Not like a visual coming from a book, or written on a whiteboard." Another student, Madison, lived just up the road from Bayshore until her family's home burned down three years ago and witnessed the first changes in the landscape at Bayshore when it became a preserve. "It's good to be outside because you get physical education and you get to look at a lot of stuff," she said. "I like coming out here to do hands-on learning and have fun with my friends."



Capitol Land Trust in particular has done a huge amount of work to realize the initial vision of using Bayshore as a place to provide Shelton School District students with these learning opportunities. Daron Williams, Community Conservation Manager, and Mary Birchem, AmeriCorps Restoration Coordinator, are the land trust's "boots on the ground," making the improvements needed each year to transform the program from an average field trip to a PEI-style high impact field experience. Of his drive to help make these experiences happen for students, Daron said:

> Doing FieldSTEM—where [students] can get the knowledge they need in a way that actually works for them—can help connect them with the land they live on. Shelton is an economically impoverished area. And a lot of families are struggling... As a small organization, we bring a capacity that the schools don't have on their own. And that can make a difference in the students' lives. Doing these project-based lessons, we could actually be helping students get through school that maybe wouldn't have, and get them excited about science. This is a way to show them how science is connected to the real world.

Both Mary and Daron are also motivated by their desire to increase awareness among students about science-related career opportunities in their community. For Mary, it was a high school environmental science teacher and a field trip to the St. Louis city landfill that "totally changed [her] world." While other students goofed off in class, Mary got 110%. And ultimately, the teacher and the field trip inspired her to pursue a career in environmental education. Speaking about what motivates her to create fun and meaningful field investigations for students, she said, "I want to be that for them. I want them to know that they can do it… that science doesn't have to be scary. It doesn't have to be this huge far-off topic that doesn't apply to them or that they can't do."



Being from a rural town in eastern Washington that is just one quarter the size of Shelton, Daron knows firsthand how hard it can be to get accurate information about science career paths and how to achieve employment in them. From a young age, he wanted to be a naturalist, but as he went through elementary, middle and high school, he didn't know that such a job even existed. "I knew there were research scientists out there, but it seemed like only a few—people with PhDs. I never knew about the technician level and all the people out there doing restoration. I just never knew it was an option." Because of this, he only learned about and gained experience in restoration *after* obtaining a bachelor's degree in politics—a field in which he didn't have much interest in working. Now, with a technical degree in water resources, a master's degree in environmental science and work experience with the US Geological Survey, he is passionate about helping kids who are interested in science-related careers to make informed decisions about their academic and professional pursuits.

To this end, Daron and Mary have worked tirelessly to increase student engagement and develop the program curriculum. When the program started in 2015, Daron collaborated with teachers to correlate what Bayshore offers and what is taught in the field to what students are learning in the classroom, ensuring that the lessons are aligned with state and national learning standards. In the summer of 2017, a year into her AmeriCorps service with Capitol Land Trust, Mary began recruiting additional volunteer teachers (for which there is still a great need), and then designed and implemented a program to train them, further developing the curriculum in the process. Together, they have worked to adjust the schedule and coordinate the logistics of the field experience with district teachers. And on field experience days, both Mary and Daron work alongside the volunteer teachers—through rain, snow and freezing temperatures—to help them guide students through the FieldSTEM tasks.

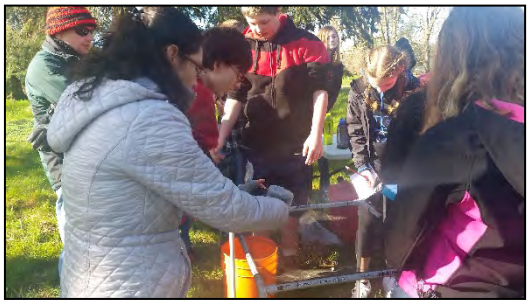
Over the past two years, Daron and Mary have also made recommendations to the land trust for the purchase of materials and supplies needed to accomplish the learning objectives (in addition to the buses and portable restrooms that the land trust was already providing). This has included tables, tents and enlarged, laminated printouts of the field journal at the three learning stations, along with pencils and write-in-the-rain paper for students. According to Wendy Boles, the write-in-the-rain paper, together with clipboards donated by PEI, and the enlarged field journals have vastly improved students' ability to follow the activities and accurately record their data. Going the extra mile, Daron stayed up until 11:00 one night building stands for the enlarged field journals, and then made repairs after their first use in the field. Their current goal is to have stands built for the iPads they have acquired so that students can learn how to use real-world data-recording tools. When the stands are built, and the iPads are put to use, the schools will then incorporate that data into their science curriculum, enabling students to see the changes at Bayshore

from one year to the next and make comparisons. Mary and Daron hope to have these additional tools available for students to use in March 2018.

This year especially, their effort shows. Viola Moran, student teacher at Olympic Middle School, shared her observation of Fiona (her name has been changed to protect her privacy) during the field investigation at Bayshore. A high-needs student in one of the district middle schools, Fiona doesn't like to be the center of attention. As a rule, she doesn't participate in activities or raise her hand in class. The commotion that comes with being in large groups of people makes her feel so uncomfortable that she waits in the bathroom until the hallways clear out during breaks before going to class. And when she gets there, she doesn't want to sit with the other students.

When the Bayshore field investigation day was announced, Fiona said, "I'm not going. I'll be sick that day." But in spite of her reluctance, she got her permission slip in and ended up attending. And in the course of the afternoon, she became so engaged in the fieldwork that she and her classmates were doing that she volunteered to throw one of the pears during the fruit race. She also offered to draw an example of a macroinvertebrate on the board for the class—a profound shift from what Viola had observed in the classroom.

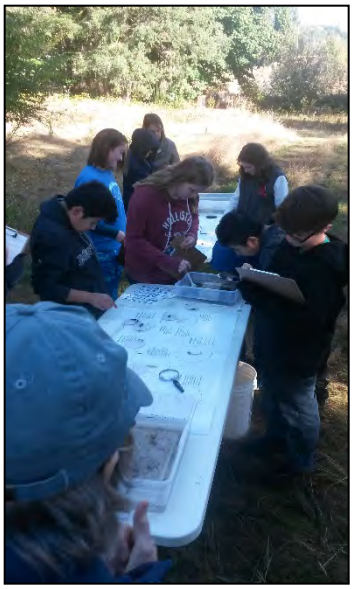
Throughout the first field investigation day, as well as the week following, Wendy, Viola, Mary, Daron and several of the volunteer teachers remarked that student engagement is at an all-time high this year. With the inevitable exceptions of "kids being kids," the students listened attentively, asked questions, volunteered for a variety of tasks and diligently took notes and recorded their data. Viola and Wendy also observed that the students handled the creatures more gently this year than in the past. At the "Tidal Life" station, for example, on the first day of the field investigation, a group of students were very concerned about a hermit crab that had shed its shell in the molting process. They spent 10 minutes trying to persuade the crab to crawl into a shell they'd found on the shore while offering various words of encouragement: "You want your shell!" and "Come on, man, you need a home!"



Viola expounded on the above anecdote by adding:

> Even though this is their community, there's a good portion of [the students] that have never actually been around the creatures out there. And so, seeing the hermit crabs and the different specimens that they got to handle—they were just fascinated by that… And as they grow up, it's right there. It's a part of their environment.

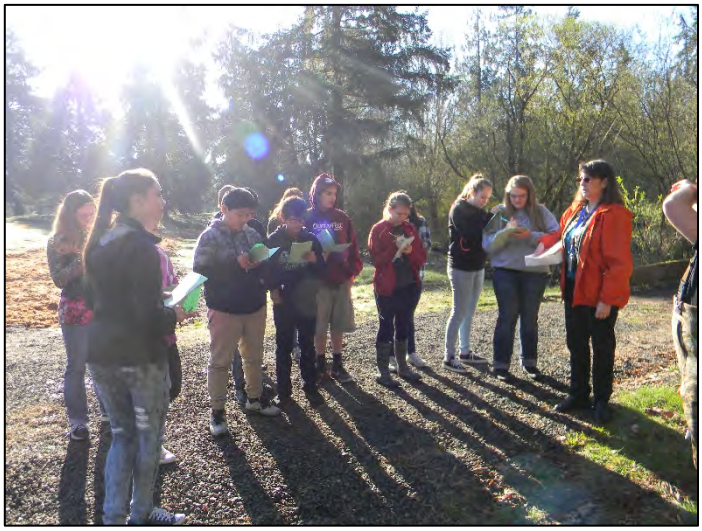
What's more, the impact of the field experience was evident in the classroom after the students went to Bayshore. "When we are going over 'producer, consumer and decomposer,'" Viola said, "they are relating back to the information they got at Bayshore."



Susie Vanderburg, retired elementary school teacher, former Thurston County Stream Team Coordinator and former Education Director for Olympia's LOTT WET Science Center, agrees with Viola. "A lot of kids today are not getting exposed to the outdoors, not having experiences outside. They're not given opportunities to love the land and be fascinated." As a volunteer teacher at the freshwater macroinvertebrate station, Susie attended the all-day volunteer training in the summer, and on field experience days, she arrives at Bayshore at 7:00 AM to set up—two days in a row in October and March—teaches until 2:00 PM and then spends an hour breaking down the station and putting equipment away. While her work as a volunteer is a big commitment, she does it because she believes that giving kids the opportunity to learn science outside, in the field, simultaneously gives them the opportunity to become stewards of the land they live on. "In environmental education we always say, once you get to

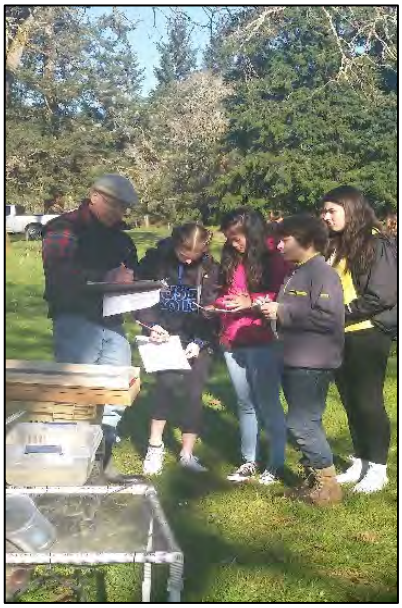
know something, like a wetland or a prairie, then you begin to care about it. It's personal. And if you care about it, then you're willing to do something to protect it. If you never get outside and get to know the outdoors, you're never going to care about it, you're not going to protect it."

While young people's lack of exposure to the natural world poses a challenge, Wendy Boles, who is in her 15th year as a science teacher and is another major force behind creating and facilitating these powerful experiences for students, has begun to feel a surge of hope with a discovery she's made in her classroom in recent years. It used to be that students entered her 7th grade class without any knowledge about (and very little interest in) the problems caused by issues such as overpopulation, resource depletion and pollution. In the past few years, however, Wendy has noticed in her students an increased awareness of and concern about climate change and environmental issues. She sees field investigations as an opportunity to help kids make the connection between these issues and how they impact their community. She hopes that by having these real-world science learning experiences, her students will discover what they love to do, learn about science-related careers in their communities and be empowered to pursue them if that's their dream.



Along with the work she does to help integrate the field investigation tasks with the district's science curriculum, Wendy helps train volunteers and coordinate schedules with Capitol Land Trust, district teachers and the English language support staff that the district provides. "It is a lot of work. I mean *a lot* of work," she said of the field investigation days. But all of that becomes worth it when she witnesses the new awareness among her students and their desire to be good stewards of the environment. "The kids are starting to go, *Wow, we have to start caring about the environment.* That to me is the biggest thing because if we aren't taking measures to be good stewards, we are going to be in trouble. That's my concern. Making sure that our planet can continue to support us in a way that we're used to."

At Bayshore, several individuals and community partners have come together to seize this opportunity by providing Wendy's students, and every 6th and 7th grade student in the Shelton School District, with real-world, project-based, career-connected science education. The hope is that this education will enable them to lead richer and more meaningful lives. And that they, in turn, will draw from their time exploring and learning science out in their community to generate change where they can. Yes, it is a lot of work. Everyone involved agrees with Wendy on that. But they do it because they believe that the return will be well worth the effort.



**If you are interested in volunteering to help students learn project-based science at Bayshore, please contact Mary Birchem, Restoration Coordinator at Capitol Land Trust* mary@capitollandtrust.org

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The Pacific Education Institute (PEI) is a statewide 501(c)(3) professional learning organization that empowers educators to take students outdoors to learn integrated, real-world science. To learn more about our programs and how to bring FieldSTEM to your school or school district, please connect with us at www.pacificeducationinstitute.org